1) write a python program to calculate the area of a rectangle given its length and width.

Ans- The area of a rectangle with a length of 5 units & a width of 10 units is calculated to be 50 square units using the formula

[\text{Area} = \text{length} \times \text{width}]

2) write a program to convert miles to kilometers

Ans:- to convert 5 miles to kilometers, we use the conversion factor (1 \text{mile} = 1.60934 \text{kilometers}). Thus, 5 miles is equivalent to approximately 8.0467 kilometers.

3) write a function to check if a given string is a palindrome.

Ans:- The function to check if a given string is a palindrome returns.

- True for the string "racecar", indicating it is a palindrome.
- False for the string "hello", indicating it is not a palindrome.

4) write a python program to find the second largest element in a list.

Ans:- the second largest element in the example list ([10, 20, 4, 45, 99, 45, 99]) is found to be (45), after removing duplicates & sorting the unique elements.

5) Explain what indentation means in python.

Ans:

In python, Indentation refers to the use of whitespace (spaces or tabs) at the beginning of a line to define the level of grouping of statements. It is a critical aspect of python syntax that differentiates it from many other programming languages which use braces ({}) or keywords to define blocks of code.

Indentation in python serves two primary purposes:

1. To Indicate a block of code:-

python uses indentation to define the blocks of code associated with control each new block, & back to the previous level when the block ends.

2. To enhance readability:

Consistent use of indentation makes python code very readable. since the blocks of code are visually separated by Indentation levels, It becomes easier to understand the flow of a program and the relationships between different parts of the code.

failure to properly indent code in python results in a

Indentation Error; making the code unable to run. This strict enforcement encourages a uniform coding style & contributes to the readability & main-tainability python code.

6) write a program to perform set difference operation.

Ans:- The program performs a set difference operation on two example sets ({1, 2, 3, 4, 5}) & ({4, 5, 6, 7, 8})

resulting in ({1, 2, 3}). This represents the elements that are in the first set but not in the second set.

7) write a python program to print numbers from 1 to 10 using a while loop.

Ans :- The python program successfully printed numbers from 1 to 10 using a while.

Python:-

```
num = 1
while num <=10:
    print (num)
    num += 1
```

8) write a program to calculate the factorial of a number using a while loop.

Ans:- The program calculated the factorial of the number 5 using a while loop, resulting in (120). the factorial of a number (n) is the product of all positive integers less than or equal to (n), denoted as (n!).

9) write a python program to check if a number is positive, negative, or zero using if-elif-else statements.

Ans:

The python program checks if a number is positive, negative, or zero using if-elif-else statements & returns:

- For the number 10, It returns "positive".
- For the number -5, It returns "Negative".
- For the number 0, It returns "zero".

10) write a python programs to create a numpy array filled with ones of given shape.

Ans:- The python program created a Numpy array filled with ones having the shape of 3 rows & 4 columns, as specified.

11) write a program to determine the largest among three numbers using conditional Statements?

Ans:- The program determines the largest among three numbers (10), (14), & (12) using conditional Statements, & Identifies (14) as the largest number.

12) ~~The~~ write a program to create a 2D numpy array initialized with random integers.

Ans:- The program created a 2D Numpy array with the shape of 3 rows & 4 columns, initialized with random integers ranging from 1 to 9 (inclusive).

13) write a Python program to generate an array of evenly spaced numbers over a specified range using linspace.

Ans:- Certainly! Here's a python program that uses Numpy's linspace function to generate an array of evenly spaced numbers over a specified range:

Python:

```
import numpy as np
# Define the range and the number of elements
start = 0
stop = 10
num_elements = 5
# Generate the array
result = np.linspace(start, stop, num_elements)
#print the result
print(result)
```

example:-

start is the starting value of this range, stop is the end value of the range, and num_elements is the number of elements you want in the array. The linspace function will generate num_elements evenly spaced numbers, between start and stop. Inclusive

14) corite a program to generate an array of 10 eaually spaced values b/w 1 & 100 using linspace.

Ans: Here's a python program that uses Numpy's linspace function to generate an array of 10 eaually spaced values b/w 1 and 100:

```
import numpy as np
# Generate the array
result = np. linspace (1, 100, 10)
# print the result
print (result)
```

In this program, np. linspace (1, 100, 10) generates an array of 10 eaually spaced values b/w 1 and 100, inclusive. the result is an array [1., 12., 23., 34., 45., 56., 67., 78., 89., 100.].

15). write a Python program to create an array containing even numbers from 2 to 20 using arrange.

Ans:-

We can use Numpy's arange function to create an array containing even numbers from 2 to 20. Here's the Python program:

```
import numpy as np
# Generate the array
result = np.arange(2, 21, 2)
# print the result
print(result)
```

In this program, np.arange(2, 21, 2) generates an array starting from 2, ending at 20 (exclusive), with a step size of 2. The result is an array [2, 4, 6, 8, 10, 12, 14, 16, 18, 20], which contains the even numbers from 2 to 20.